

What Is Claimed Is:

1. An expandable stent deployment assembly for stent implantation within a patient's body, comprising:
 - an expandable stent with a polymer coating on at least a portion of an inner surface of the stent;
 - a stent expansion balloon, expandable from a first configuration to a second configuration, the balloon sized to fit within the expandable stent when the balloon and the stent are unexpanded; and
 - a compliant sheath located between the stent expansion balloon and the stent.
2. The expandable stent deployment assembly of claim 1, wherein the stent is in contact with the sheath when the stent is unexpanded.
3. The expandable stent deployment assembly of claim 2, wherein the stent is crimped over the sheath.
4. The expandable stent deployment assembly of claim 1, wherein the polymer coating comprises at least one therapeutic agent.
5. The expandable stent deployment assembly of claim 4, wherein the polymeric material comprises one of polyamide, thermoplastic polyamide, polyester, polyphenylene sulfide, and polyethylene terephthalate.
6. The expandable stent deployment assembly of claim 4, wherein the compliant sheath comprises one of Latex and silicone rubber.
7. The expandable stent deployment assembly of claim 1, wherein the compliant sheath is closed about at least one of a distal end and a proximal end of the stent expansion balloon.
8. The expandable stent deployment assembly of claim 1, wherein the compliant sheath comprises a tube, and further wherein the length of the tube is equal to or greater than the length of the stent.

9. The expandable stent deployment assembly of claim 1, further comprising an adhesive located between the compliant sheath and the stent expansion balloon.
10. The expandable stent deployment assembly of claim 9, further comprising an adhesive located between a distal end of the compliant sheath and the distal end of the stent expansion balloon.
11. The expandable stent deployment assembly of claim 8, further comprising an adhesive located at at least one location between the tube and the stent expansion balloon, wherein an amount and the location of said adhesive are such that movement of the balloon relative to the sheath during stent expansion is not inhibited in a manner that permits a coating on the stent to be damaged.
12. The expandable stent deployment assembly of claim 1, further comprising a lubricant located between the compliant sheath and the stent expansion balloon.
13. The expandable stent deployment assembly of claim 1, wherein the stent is in contact with the compliant sheath over the entire length of the stent.
14. The expandable stent deployment assembly of claim 1, wherein the stent is crimped over the compliant sheath over the entire length of the stent.
15. The expandable stent deployment assembly of claim 1, wherein the stent is in contact with the compliant sheath at at least one of a distal end and a proximal end of the stent.
16. The expandable stent deployment assembly of claim 1, wherein the stent is crimped over the compliant sheath at at least one of a distal end and a proximal end of the stent.
17. The expandable stent deployment assembly of claim 1, further comprising a lubricant located between the compliant sheath and the stent expansion balloon.
18. The expandable stent deployment assembly of claim 1, wherein the compliant elastic material is translucent or transparent.

19. A method for using the expandable stent deployment assembly of claim 1, comprising the steps of:

inserting the expandable stent assembly mounted on a catheter into a patient's body;
maneuvering the expandable stent assembly to a desired location within the patient's body;
causing the stent expansion balloon to expand until the stent has expanded to a desired size;
causing the stent expansion balloon to deflate; and
removing the stent expansion balloon and sheath from the patient's body after the sheath disengages from the expanded stent.

20. A method for reducing the frictional forces placed on an expandable stent during stent deployment, comprising the steps of:

inserting a catheter having at a distal end thereof an expandable stent assembly into a patient's body, the expandable stent assembly having a non-compliant stent expansion balloon, a compliant elastic sheath over an outer circumference of the non-compliant stent expansion balloon, and the expandable stent crimped over the compliant elastic sheath; and
expanding the non-compliant stent expansion balloon beneath the compliant elastic sheath in order to deploy the stent.

21. A method for manufacturing an expandable stent deployment assembly, comprising the steps of:

expanding in a radial direction a tubular sheath made of a compliant elastic material;
inserting an unexpanded stent expansion balloon mounted on a catheter into the expanded sheath stent assembly;
permitting the expanded sheath to contract and conform to the outer surface of the non-compliant stent expansion balloon;
inserting the assembled non-compliant stent expansion balloon and compliant elastic sheath into an unexpanded stent; and
causing the stent to be in contact with the compliant elastic sheath.

22. The method of claim 21, wherein the step of causing the stent to be in contact with the compliant elastic sheath further comprises crimping the stent over the compliant elastic sheath.